

REMARKS

Claims 7-45 are pending in the above identified application. In the last Office Action, the Examiner rejected claims 1-9, 11-17, 23-25, 28, 29, 32-39, and 41-45 and objected to claims 10, 18-22, 26-27, 30, 31, and 40. By this amendment, Applicants have amended the independent claims, claims 7, 38, and 45 to clarify the invention.

Interview

Applicant thanks the Examiner for taking the time to discuss this application with Applicant's representative, Gary J. Edwards, and Mr. P. J. Sallaway. During the interview, we discussed the claims with respect to the prior art. The amendments made to the claims in this paper were discussed and agreement was reached that the claims, amended as shown herein, would be allowable over the prior art.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 7, 38, 44, and 45

Claims 7, 38, and 44 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,781,617 to McHale et al. ("McHale") in view of U.S. Patent No. 5,822,368 to Wang ("Wang"). As discussed in previous papers, McHale teaches "[a] communication server (58) [that] includes a plurality of pairs of frequency agile modulators (638) and demodulators (640) each set to operate at a unique frequency and associated with a twisted pair data line (54)." (McHale, abstract). As shown in Figure 1 of McHale, McHale teaches

a communication system 10 that provides both telephone and data service to a subscriber 12. A central office 14 is coupled to subscriber 12 using subscriber line 16. In operation, central office 14 provides telephone and data service to subscriber 12 using subscriber line 16. Subscriber line 16 supports simultaneous telephone and data service using twisted pair wiring.

(McHale, col. 4, lines 40-46). In addition, “[c]ommunication system 10 includes numerous other twisted pair subscriber lines 16 coupled to other subscribers 12.” (McHale, col. 5, lines 22-24). As further shown in Figure 1, “[c]entral office 14 includes a splitter 50 coupled to subscriber line 16 . . . [that] . . . divides subscriber line 16 into a twisted pair phone line 52 and a twisted pair data line 54.” (McHale, col. 5, lines 50-54). Therefore, each of the data lines 54 corresponds to a single subscriber line. Further, “communication server 58 is coupled to splitter 50 using data line 54.” (McHale, col. 5, lines 64-65). Additionally, “[c]ommunications server 58 multiplexes modem digital outputs into a multiplexed digital line 62 for delivery to a router or other network device 60.” (McHale, col. 6, lines 26-28). Figure 13A, which is cited by the Examiner as teaching certain elements of claim 7, “illustrates in more detail a frequency multiplexing implementation for switching modem connections in communications server 58.” (McHale, col. 19, lines 64-66). In particular,

[a]s shown, data lines 54 are coupled to receiver/buffers 630 and transmit/buffers 632. . . . For each data line 54, communications server 58 includes a frequency agile modulator 638 and a frequency agile demodulator 640. Each modulator 638 operates to modulate an incoming analog signal at a selectable frequency. In the illustrated embodiment, the frequency is set to one of a plurality of frequencies, f1 to fN, equal in number to the number of available modems. Similarly, each demodulator 640 operates to demodulate at a selectable frequency where the frequency is set to one of the plurality of frequencies, f1 to fN. Associated modulators 638 and demodulators 640 are set to operate at the same frequency.

(McHale, col. 20, lines 2-16). Therefore, McHale teaches that the analog data signals from each subscriber is modulated by one of the frequencies and transmitted to a matched demodulator. As discussed above, there is no need for, and no teaching that, the digital data between subscriber lines be synchronized.

McHale's teaching of a system where signals from each subscriber are independently transmitted to one of several digital modems by modulating the signal from each subscriber by a different frequency, is very different from the invention claimed in claims 7, 38, and 45. In particular, McHale does not teach or suggest a "serial/deserializer transmission system . . . wherein the plurality of demodulators recover a plurality of bits synchronously distributed across the plurality of transmission bands in the serial/deserializer transmission system, the plurality of demodulators being synchronous to each other," as is recited in claim 7 (emphasis added), or "each of the plurality of demodulators receiving signals from one of a plurality of transmission bands synchronously with others of the plurality of demodulators," as is recited in claim 38 (emphasis added), or "wherein a plurality of bits that were synchronously transmitted across the plurality of transmission bands is recovered, the means for down-converting, means for obtaining, means for equalizing, and means for decoding for each of the plurality of transmission bands are synchronous to each other," as is recited in claim 45 (emphasis added).

Wang does not cure the defects in the teachings of McHale. Instead, Wang teaches "[a] digital audio broadcasting (DAB) system [that] includes a radio-frequency (RF) receiver that develops a characterization signal representative of a respective mobile communications channel as a precursor to estimating a channel impulse response." (Wang, abstract). As shown in Figure 1 of Wang, for example, only a single analog audio input is utilized. Wang, therefore, does not teach a serializer/deserializer transmission system as is recited in Applicants' independent claims 7, 38, or 45. Therefore claims 7, 38, and 45 are allowable over the combination of McHale and Wang. Claim 44 depends from claim 38 and is allowable over the combination of McHale and Wang for at least the same reasons as is claim 38.

Claims 8-9 and 15-17

Claims 8, 9, and 15-17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over McHale in view of Wang, and in further view of U.S. Patent No. 6,163,563 to Baker (“Baker”). Claims 8, 9, and 15-17 depend from claim 7, and thus require all of the elements recited in claim 7. As discussed above, claim 7 is allowable over the combination of McHale and Wang. Baker does not cure the defects in the teachings of McHale and Wang. Baker, instead, teaches “a technique useful in a receiver for correlating a generated, known sequence with received signal samples to determine the received signal samples in a multi-chip data sequence.” (Baker, col. 1, lines 8-11). Baker does not teach or suggest a “serial/deserializer transmission system . . . wherein the plurality of demodulators recover a plurality of bits synchronously distributed across the plurality of transmission bands in the serial/deserializer transmission system,” as is recited in claim 7 and required by dependent claims 8, 9, and 15-17.

Therefore, claim 7 is allowable over the combination of McHale, Wang, and Baker. Claims 8-9 and 15-17 depend from claim 7 and are therefore allowable over the combination of McHale, Wang, and Baker for at least the same reasons as is claim 7.

Claims 11-14

Claims 11-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over McHale in view of Wang, as applied to claim 9, and in further view of U.S. Patent No. 5,844,950 to Aono et al. (“Aono”). Claims 11-14 depend from claim 7 and thus require all of the elements recited in claim 7. As discussed above, claim 7 is allowable over the combination of McHale and Wang. Aono does not cure the defects in the teachings of McHale and Wang. Aono teaches “[a] cross polarization interference canceler [that] includes a digital conversion circuit for subjecting a demodulated signal of one channel to an analog-to-digital conversion out of two channels which

are independently formed using carriers having the same frequency but having planes of polarization which are mutually orthogonal.” (Aono, abstract). Therefore, Aono also does not teach or suggest a “serial/deserializer transmission system . . . wherein the plurality of demodulators recover a plurality of bits synchronously distributed across the plurality of transmission bands in the serial/deserializer transmission system,” as is recited in claim 7 and required by claims 11-14.

Therefore, claim 7 is allowable over the combination of McHale, Wang, and Aono. Claims 11-14 depend from claim 7 and are therefore allowable for at least the same reasons as is claim 7.

Claim 23

Claim 23 is rejected under 35 U.S.C. § 103(a) as being unpatentable over McHale in view of Wang, as applied to claim 8, and in further view of U.S. Patent No. 4,599,732 to LeFever (“LeFever”). As discussed above, claim 8 is allowable over the combination of McHale and Wang. LeFever does not cure the defects in the teachings of McHale and Wang. LeFever teaches “[a] signal processing scheme through which the receiver may, at any time, synchronize or resynchronize itself to the transmitted data signals that are received over a dynamic dispersive channel.” (LeFever, abstract). LeFever does not teach or suggest a “serial/deserializer transmission system . . . wherein the plurality of demodulators recover a plurality of bits synchronously distributed across the plurality of transmission bands in the serial/deserializer transmission system,” as is recited in claim 7, from which claim 8 depends.

Therefore, claim 8 is allowable over the combination of McHale, Wang, and LeFever. Claim 23, which depends from claim 8, is allowable over the combination of McHale, Wang, and LeFever for at least the same reasons as is claim 8.

Claim 24

Claim 24 is rejected under 35 U.S.C. § 103(a) as being unpatentable over McHale in combination with Wang in view of LeFever, as applied to claim 23, and in further view of U.S. Patent No. 6,351,677 to Leyonhjelm (“Leyonhjelm”). As discussed above, claim 23 is allowable over the combination of McHale, Wang, and LeFever. Leyonhjelm does not cure the defects in the teachings of McHale, Wang, and LeFever. Instead, Leyonhjelm teaches “a Cartesian control means (16) comprising a phase rotator (50) and a phase adjuster (52).” (Leyonhjelm, abstract). Leyonhjelm does not teach or suggest a “serial/deserializer transmission system . . . wherein the plurality of demodulators recover a plurality of bits synchronously distributed across the plurality of transmission bands in the serial/deserializer transmission system,” as is recited in claim 7, from which claim 23 depends.

Therefore, claim 23 is allowable over the combination of McHale, Wang, LeFever, and Leyonhjelm. Claim 24, which depends from claim 23, is allowable for at least the same reasons as is claim 23.

Claims 25 and 28-29

Claims 25, 28, and 29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over McHale in view of Wang, as applied to claim 8, and in further view of U.S. Patent No. 6,121,828 to Sasaki (“Sasaki”). As discussed above, claim 8 is allowable over the combination of McHale and Wang. Sasaki does not cure the defects in the teachings of McHale and Wang. Sasaki teaches “a demodulator . . . which keeps an average power of an IF input signal constant by means of an analog AGC circuit and compensates an error in the IF input signal by means of a digital AGC circuit situated after an equalizer so that an output signal of the demodulator is represented by regular signal points corresponding to the optimum BER (bit error rate)

characteristic.” (Sasaki, col. 1, lines 4-11). Sasaki does not teach or suggest a “serial/deserializer transmission system . . . wherein the plurality of demodulators recover a plurality of bits synchronously distributed across the plurality of transmission bands in the serial/deserializer transmission system,” as is recited in claim 7, from which claim 8 depends.

Therefore, claim 8 is allowable over the combination of McHale, Wang, and Sasaki. Claims 25, 28, and 29 depend from claim 8 and are allowable over the combination of McHale, Wang, and Sasaki for at least the same reasons as is claim 8.

Claims 32-37

Claims 32-37 are rejected under 35 U.S.C. § 103(a) as being unpatentable over McHale in view of Wang, and in further view of U.S. Patent No. 6,351,293 to Perlow (“Perlow”). Claims 32-37 depend from claim 7, and thus require all of the elements recited in claim 7. As discussed above, claim 7 is allowable over the combination of McHale and Wang. Perlow does not cure the defects in the teachings of McHale and Wang. Perlow teaches “[a] decision directed phase detector that uses the quantized data output from a slicer to aid the phase error detection process to determine a phase error of a complex signal such as a vestigial sideband (VSB) signal containing in phase (I) and quadrature phase (Q) components (I and Q signals).” (Perlow, abstract). Perlow does not teach or suggest a “serializer/deserializer transmission system” as recited in claim 7 and required by claims 32-37.

Therefore, claim 7 is allowable over the combination of McHale, Wang, and Perlow. Claims 32-37 depend from claim 7 and are therefore allowable for at least the same reasons as is claim 7.

Claims 39 and 41-43

Claims 39 and 41-43 are rejected under 35 U.S.C. § 103(a) as being unpatentable over McHale in view of Wang, and in further view of U.S. Patent No. 5,715,280 to Sandberg et al. (“Sandberg”). Claims 39 and 41-43 depend from claim 38, and thus require all of the elements recited in claim 38. As discussed above, independent claim 38 is allowable over the combination of McHale and Wang. Sandberg does not cure the defects in the teachings of McHale and Wang. Sandberg teaches “an improved method for transmitting or receiving subsets of data for use in” multicarrier transmission systems. (Sandberg, col. 1, lines 6-9). Sandberg, however, does not teach or suggest a serial/deserializer system where “a plurality of bits having been encoded and transmitted across the plurality of transmission bands . . . wherein the plurality of bits synchronously transmitted across the plurality of transmission bands of the serial/deserializer system is recovered,” as is recited in claim 38 and required by claims 39 and 41-43.

Therefore, claim 38 is allowable over the combination of McHale, Wang, and Sandberg. Claims 39 and 41-43 depend from claim 38 and are therefore allowable for at least the same reasons as is claim 38.

Claim 45

Claim 45 is rejected under 35 U.S.C. § 103(a) as being unpatentable over McHale in view of Wang. As discussed above with respect to claims 7 and 38, the combination of McHale and Wang does not teach or suggest “a receiver system in a serial/deserializer system . . . wherein a plurality of bits that were synchronously transmitted across the plurality of transmission bands is recovered, the means for down-converting, means for obtaining, means for equalizing, and means for decoding for each of the plurality of transmission bands are synchronous to each

other” as is recited in claim 45 (emphasis added). Claim 45, therefore, is allowable over the combination of McHale and Wang.

Allowable Subject Matter

The Examiner objected to claims 10, 18-22, 26, 27, 30, 31, and 40 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants thank the Examiner for indicating the allowable subject matter. Claims 10, 18-22, 26-27, and 31 all depend from claim 7, which as indicated above is allowable over the cited art. Therefore, Applicant has not amended claims 10, 18-22, 26-27, and 31 in this amendment.

Conclusion

Applicants respectfully request that this Amendment under 37 C.F.R. § 1.116 be entered by the Examiner, placing claims 7-45 in condition for allowance. Applicants submit that the proposed amendments of claims 7-45 do not raise new issues or necessitate the undertaking of any additional search of the art by the Examiner, since all of the elements and their relationships claimed were either earlier claimed or inherent in the claims as examined. Therefore, this Amendment should allow for immediate action by the Examiner.

Furthermore, Applicants respectfully point out that the final action by the Examiner presented some new arguments as to the application of the art against Applicants' invention. It is respectfully submitted that the entering of the Amendment would allow the Applicants to reply to the final rejections and place the application in condition for allowance.

Finally, Applicants submit that the entry of the amendment would place the application in better form for appeal, should the Examiner dispute the patentability of the pending claims.

In view of the foregoing remarks, Applicants submit that this claimed invention, as amended, is neither anticipated nor rendered obvious in view of the prior art references cited against this application. Applicants therefore request the entry of this Amendment, the Examiner's reconsideration of the application, and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account 06-0916.

Respectfully submitted,

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